

# A NEW AUSTRALIAN LICHEN: CLADONIA KURINGAIENSIS

by

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## INTRODUCTION

The fruticose lichen genus *Cladonia* contains a number of species which are placed together in the *Cladonia verticillata* group. This group is characterised by esorediate, corticate, cup-shaped podetia (scyphi), with each scyphus producing central proliferations in the form of further scyphi. The typical species of the group, *Cladonia verticillata* (Hoffm.) Schaer. and the related species *Cladonia calycantha* Nyl., *Cladonia gymnopoda* Vain., *Cladonia pseudogymnopoda* Asah. and *Cladonia verticillaris* (Raddi) Fr. contain the  $\beta$ -orcinol depsidone fumarprotocetraric acid as the only lichen compound present (Zopf 1908, Asahina 1940, 1970, 1943). Other members of the group contain fumarprotocetraric acid with atranorin — *Cladonia krempehuberii* (Vain.) Vain. (Asahina 1956) and *Cladonia subcervicornis* (Vain.) Kernst. (Asahina 1943) — or fumarprotocetraric acid with homosekikaic acid — *Cladonia calyciformis* Nuno (Nuno 1972) — or lack fumarprotocetraric acid and contain other lichen compounds; *Cladonia dissimilis* Asah. contains atranorin and homosekikaic acid (Asahina 1940) and *Cladonia rappii* Evans contains psoromic acid (Evans 1952). *Cladonia verticillata* and *Cladonia krempehuberii* are the only members of this group reported to occur in Australia (Weber and Wetmore 1972).

A recent chemical examination of specimens of *Cladonia verticillata* sens. lat. from the Sydney region showed that specimens with squamulose scyphi contained stictic acid in addition to fumarprotocetraric acid (Archer 1979); esquamulose specimens contained only fumarprotocetraric acid and were identified as *Cladonia verticillata* (Hoffm.) Schaer. The specimens with stictic acid and squamulose scyphi are now differentiated as a separate species.

## DESCRIPTION

***Cladonia kuringaiensis*** A. W. Archer, sp. nov.

Habitus thalli ut in *Cladonia verticillata* sed squamulis in marginibus scyphorum et acidum sticticum acido fumarprotocetrarico usuali continentia.

The appearance of the thallus as in *Cladonia verticillata* but with squamules on the margins of the scyphi and containing stictic acid as well as the usual fumarprotocetraric acid.

*Primary squamules* persistent or disappearing, up to 5 mm long, irregularly wedge-shaped, resembling the squamules on the scyphi; upper side green to olive-green, below white. *Podetia* dull whiteish-green to olive-green, esorediate, with or without squamules, arising from the upper side of the primary squamules, 20-40 mm tall and up to 1.5 mm diam., expanding into small cups to 5 mm diam., appearing wider due to the presence of marginal squamules; each podetium with one or more proliferations from the centre of the closed cup; margins of the scyphi squamulose with irregularly crenate squamules 2-4 mm long and 0.5-1 mm wide; *cortex* continuous or areolate, the areoles smooth and the interspaces white; *Apothecia* sessile or on short stipes, 0.3-0.5 mm in diam.; pale brown to reddish-brown, flat, becoming convex; *ascospores* 8/ascus, simple, ellipsoid, colourless, 10-15 x 3-4  $\mu$ m.

REACTION: K+ weak yellow-brown; C-; Pd+ yellow becoming red. Fumarprotocetraric and stictic acids were shown to be present in an acetone extract by thin-layer chromatography and the presence of stictic acid was confirmed by mass spectrometry (Archer 1979).

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*Muelleria* 4 (3): 273-275 (1980).



Fig. 1. *Cladonia kuringaiensis*. Typical specimens showing squamulose scyphi. Scale in millimetres.

TYPE COLLECTION: Australia, New South Wales, Ku-ring-gai Chase National Park, on soil on sandstone rock, near Spring Gully Creek, 4 km SSW of Bobbin Head, 20.i.1979, *Archer* 620 (Holotype: MEL 1023704; Isotype: NSW).

ALSO EXAMINED:

*New South Wales* — Murphy's Glen, Blue Mountains N.P., near Woodford, 20.xi.1976, *Archer* 161; Side of creek below Woody Pear Dam; Blue Mountains N.P., near Glenbrook, 16.vii.1977, *Archer* 210; Side of Biamea Creek, Dahrug N.P., near Wiseman's Ferry, 24.xii.1977, *Archer* 352 (MEL 1023705); Mt. Gibraltar, Bowral, 23.iii.1978, *Archer* 429 (NSW); Buffalo Creek, Field of Mars Reserve, North Ryde, 25.iv.1978, *Archer* 451 (NSW); Near Spring Gully Creek, 1.5 km SSW of Bobbin Head, Ku-ring-gai Chase N.P., 8.viii.1978 (topotype), *Archer* 520 (NSW); Near Spring Gully Creek, 2.5 km SSW of Bobbin Head, Ku-ring-gai Chase N.P., 8.viii.1978, (topotype), *Archer* 523 (NSW); Side of track from Murphy's Glen to Bedford Creek, Blue Mountains N.P., 10.ix.1978, *Archer* 698; Side of Waratah Creek, Ku-ring-gai Chase N.P., near Berowra, 3.ii.1979, *Archer* 629; Mount Wilson, 11.viii.1979, *Archer* 715.

#### DISCUSSION

The specific epithet *kuringaiensis* refers to the Ku-ring-gai Chase National Park from where the holotype was collected. Typical specimens are illustrated in figure 1.

*Cladonia verticillata* (Hoffm.) Schaer. is also known in a squamulose form, *Cladonia verticillata* f. *phyllocephala* (Flot.) Oliv. (Thomson 1967; plate 10, fig. 49b), while *Cladonia calycantha* f. *foliolosa* Vain., recorded from Venezuela and Peru (Vainio 1894),

was described as "a somewhat inconstant variety, with the margins of the scyphi squamulose". *Cladonia kuringaiensis* is distinguished from these morphologically similar forms by the presence of stictic acid.

#### ACKNOWLEDGEMENTS

The author is grateful to the New South Wales National Parks and Wildlife Service for permission to collect specimens in National Parks and to the N.S.W. government Analyst and the N.S.W. Health Commission for permission to publish this paper.

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Manuscript received 18 July 1979.